

REMARKS/ARGUMENTS

Claims 25-28, 30-32, 35-43, 45, 47 and 67 are active.

Claims 40-42, 47 and 67 stand withdrawn.

Applicants thank Examiner Naff for the courtesy of discussing the present application on April 25, 2011. During this interview, the obviousness rejection of Claims 25-31, 33, 35-39, 43 and 45 as being unpatentable in view of Pompe, Singh, and Richter was discussed. Briefly, it was explained that the cited art does not describe subnanometer particles as claimed and that the interpretation of the various citations of the references in support of the rejection as outlined in the Action was incorrect.

Specification page 2, lines 19-23, describes that Pompe's particles have a diameter of 3-5 nm. 3-5 nm is not sub-nanometer. Richter, at page 509, right column, first paragraph, describes "[t]he initially grown metal clusters (3-5 nm)" Thus, Pompe and Richter describe nanometer sized particles. Pompe and Richter, alone or in combination, fail to describe, or suggest, the sub-nanometer platinum particles of Claim 25. The disclosure of Singh does not cure the deficiencies of Pompe and Richter.

In Pompe et al a process is shown wherein the Pt-DNA bond is not broken. However, the applicant believes that in the present process the Pt-DNA bond is broken, since the applicant found in comparative studies a formation of very small clusters below 1 nm which can only form if the metal atoms can diffuse in the DNA.

Further, the process shown in Pompe et al yields in DNA-metal composites having a diameter of 3 to 5 nm, which is not sub-nanometer as the Pt-DNA composite of the present invention.

The examiner alleges that in Pompe would be further disclosed "that a wide spread of cluster size distribution occurs reaching from less than 1nm to more than 20 nm (page 1086, right cot, line 8 from the bottom), and obtaining an average size of 1.9 nm (page 1087, left

col, lines 1-4)” (see Office Action at page 4, first paragraph). However, the examiner is referring to a part in Pompe et al that does not relate to the metallization of DNA but to the metal cluster formation on a bacterial S-layer. A bacterial S-layer is a part of the cellular surface of prokaryotes and composed of identical proteins and glycoproteins —and not of DNA. Thus, the above citation of the examiner is absolutely irrelevant for the subject-matter of the present claims. During the interview noted above, it was explained that Pompe describes different conjugations, one with bacterial S layers, one with microtubules and then one with DNA. The section on DNA starts in the bottom of col. 2 on page 1089 and it is clear in this disclosure that Pompe does not disclose a sub-nanometer sized DNA-metal composite but only a composite having clusters with a diameter of 3 to 5 nm (see page 1090, col. 1, last paragraph).

In contrast to the process shown in Pompe, the present invention includes a step of removing non-conjugated platinum complexes before adding the reducing agent that facilitates obtaining such subnanometer sized particles.

The Examiner alleges, adding such a step of removing would be obvious “to prevent the non-attached metal complex from forming metal particles as suggested by Singh et al removing metal from the exterior of vesicles to prevent metal particles from being formed on the vesicles exterior surface” (see the Office Action at page 4, lines 22-24, and page 5 line 1).

While Singh does disclose removing metal complexes to prevent the particle formation of the exterior vesicle surface, Singh et al do not teach removing EXCESS metal complex. The removal step in Singh et al is to provide for a spatially selective metallization with respect to the interior and exterior surfaces of vesicles. Singh et al do not teach removing an excess of the metal complex to produce a thin layer of metallization. The Examiner’s characterization of the reference goes beyond what is disclosed in the cited

reference and cannot serve a basis upon which to conclude that the claimed invention would have been obvious.

The Examiner further supports his rejection by stating that “the objective of Pompe et al is to obtain metal clusters on the DNA and not at other places, and to accomplish this one would obviously have to remove non-attached metal complexes before electroless metallization” (see the Office Action at page 5, lines 1 to 3). This reasoning is flawed in many respects:

First, nowhere does Pompe et al state that it is the object to provide a selective metallization on the DNA and not on the surrounding material. This is pure speculation by the Examiner, one clearly arrived at by hindsight, which is improper. Pompe et al would have no reason to provide such a spatially selective process, as the metalized DNA wire could also be purified in later stages.

Second, the Examiner argues that the removal of excess metal complex before electroless plating would be obvious. The claimed process however requires that the non-conjugated Pt- complex is removed before adding the reducing agent. This simply is not taught or suggested by the cited art.

Regarding Richter the Examiner states that “it would have been apparent from Richter et al that metal clusters of 1 to 5 urn diameter can be obtained’ (see the Office Action at page 5, lines 5 and 6). It is believed that the Examiner refers to Richter at page 508, third full paragraph. The relevant passage reads: “A well-defined cluster system with monodisperse, regular aligned clusters of 1-5 nm diameter would allow investigations on single electron tunneling (SET) at room temperature”. First only clusters having a diameter of 1 to 5 nm and not sub-nanometer as claimed are disclosed, and second, the sentence states that such a range “would” be preferred. However, the process disclosed in Richter only

resulted in structures having a diameter of 3-5nm (see Richter et al, page 508, left col, first full paragraph; Fig 1; page 509, left col, first paragraph).

As already mentioned above, the Examiner's conclusion that Pompe et al would show a cluster size on DNA having an average diameter of 1.9 nm is erroneous but in any event 1.9 nm is not sub-nanometer range as claimed.

The Examiner's rejection is based on positions that are not taught in the references, taken out of context and clearly applied in a hindsight. For example, the Examiner purports "Clusters slightly less than 1 nm will function the same as 1 nm clusters, and to produce clusters slightly less than 1 nm would have been obvious" (see the Office Action page 5, last sentence continuing on page 6). Obviousness rejections must be based on objective evidence of record. See *In re Lee*, 277 F.3d 1338, 1343, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002) ("The factual inquiry whether to combine references must be thorough and searching."...It must be based on objective evidence of record. This precedent has been reinforced in myriad decisions, and cannot be dispensed with."). Applicants have read all of the references in their entirety and find no facts upon which this conclusion is even remotely based.

Withdrawal of the rejection is requested.

The obviousness rejection of Claim 32 as being unpatentable in view of Pompe, Singh, Richter and Newsman is traversed. Present Claim 32 depends from present Claim 25. As described above, Pompe, Richter, and Singh fail to describe, suggest, and are not enabled for the sub-nanometer platinum particles of Claim 25. Newman does not cure the deficiency of Pompe, Richter, and Singh as Newman is cited simply for the aspect of gaseous reducing agent but does not provide salient teachings to the subnanometer size nor how to achieve it in the manner that is claimed. Accordingly, the obviousness rejection must be withdrawn.

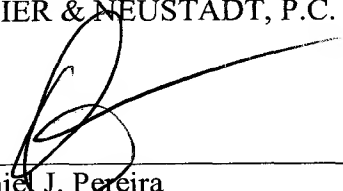
The obviousness-type double patenting rejection of Claims 25-33, 35-39, 43 and 45 as being unpatentable in view of Claims 1-32 of U.S. 6,884,587 ('587) in view of Pompe and Singh is traversed. The claims of the '587 patent require gold (Au) particles. Present Claim 25 and the claims depending therefrom employ platinum (Pt) particles. The Office citing Pompe suggests that using platinum instead of gold would have been obvious. However, as explained in detail above pertaining to the obviousness rejection, the teachings of Pompe and Singh are irrelevant to the claimed invention and indeed do not provide salient teachings to arrive at the claimed invention. Thus, when combined with the '587 patent, Pompe and Singh simply do not provide the requisite teachings and suggestion to render the claims obvious. Withdrawal of the obviousness type double patenting rejection is requested.

As mentioned during the aforementioned interview, should the Examiner find a further discussion helpful after reviewing the Applicant's comments, he is invited to contact the undersigned by telephone at his convenience.

Otherwise, a Notice of Allowance is requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Daniel J. Pereira
Registration No. 45,518

Customer Number

22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 06/04)